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treated with singular power and force. In the Carolingian period ivory was largely employed for retables, episcopal combs, caskets, pyxes and for the handles of flabella.



MIRROR CASE

French. Fourteenth Century. Combat of Armed Knights.  
Original in South Kensington Museum

Until the close of the 13th century the artist drew his inspiration from religious and legendary themes alone. In the century following we find romance and legend, the sacred and the profane, blending curiously. The Romance of the Rose, the marvelous Arthurian legends, the Spanish and Portuguese heroic poetry, furnished a new and rich store of imagery and suggestion, and the artist so long trammelled by the conventions of previous ages, was free to find his subjects in human life. Ivory at this period was employed for many articles in domestic life—caskets, coffers, horns, mirror cases and book covers. The Siege of the Castle of Love, knights tilting, hawking or flirting, or playing at chess, are sculptured with lightness, gaiety and exquisite art.

M. E. DAWSON.



## TAPESTRY—The Making

(FIRST PAPER)

The "Standard Dictionary" gives: "Tapestry . . . 1. A textile fabric in which the woof is supplied by a spindle instead of a shuttle, the design being formed by stitches across the warp." The spindle or bobbin used by tapestry-makers is "a slender spool to hold weft or thread." A shuttle is a "boat-shaped wooden carriage, enclosing a bobbin" . . . "to carry the weft-thread or filling to and fro between the warp-threads or chain," in mechanical weaving, but is not used in tapestry-making. The warp, a good old Anglo-Saxon word, is the wall or sheet of cotton or linen threads which forms the skeleton of the tapestry. The weft, woof or filling is the colored threads from the bobbin, wool or occasionally silk, which, passed through the alternate threads of the warp, at right angles to it, complete the material and form the design; the warp itself being entirely concealed.

The needle plays no part in real tapestry, except for repairs, or, in rare cases, to embroider a design on the already finished material. Yet, so loosely do we use the word, that the "Bayeux Tapestry," the most interesting and the longest piece in the world, is not tapestry at all but embroidery, called in its day, last quarter of the 11th century, "Sarrazinois." The very fine reproduction of it in the Museum well repays careful study.

The old word for real tapestry was "Arras" and it is a pity it was ever abandoned. The French to-day call all real tapestry "Gobelins." Both terms are, in reality, inexact, as each is the product of special manufactories.

Almost from its very beginning (1667) the Gobelins, in Paris, has been without a rival for large picture-tapestry. For more delicate work, such as chair-backs and seats, screens, wall panels, etc., Beauvais leads (an hour north of Paris, by train). Both of these are government institutions. At Beauvais much silk is used. Aubusson, in the Department of the Creuse, does commercial work, but has never equaled its northern rivals. The history of Aubusson is most interesting, going back, in legend, to the days of the Moors. Curiously enough, no guilds were ever established there, the consequence being that the work at times was so bad that it was not allowed to enter Paris. The Revocation of the Edict of Nantes (1685) dealt a crushing blow to Aubusson, so much so that it is only in late years that there is a complete revival of its industry.

Some of the reasons why France leads in the art of tapestry weaving, as she does in so many other arts, are that love for the beautiful, for the best in art, that seems part of the French nature; the thorough art education that is insisted on, an "Industrial Art School" forming one of the branches of the Gobelins through which every apprentice must pass, and pass with credit. Also that mysterious power of tradition. Workmen, artists one should call them, work, live and die at the Gobelins, father and son, for generations. One named Duruy, resigned lately, whose family had been employed at the Gobelins since the beginning of the 18th century.

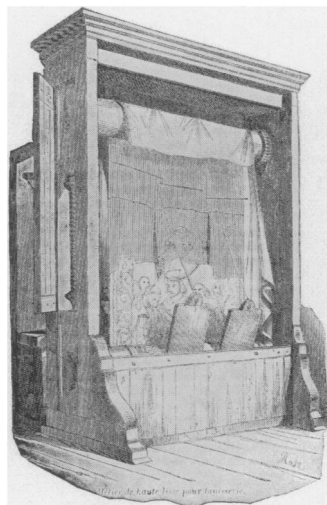
The Dyeing Department of the Gobelins is intended to serve as a model and is as perfect as anything human of its kind can be. In it all the different tints are dyed, and there are 14,420 of them! No, that is not a misprint; 14,420 shades are there for anyone who can perceive them. This was the life-work of Monsieur Chevreul, who was cut off a few years ago, at the early age of 103. The great masters of the 15th and 16th centuries used some 95 colors and their work cannot be surpassed. The present tendency of the institution is to revert to the good old scheme. When dyed the woolen or silk weft threads are wound on bobbins and are used at the Gobelins or at Beauvais; they are also sold to the public. The very best wool comes from Kent, in England.

Now let us glance at the loom. The upright loom, "haute-lisse," the only kind used at the Gobelins, consists in principle of two large horizontal, wooden cylinders, one near the floor, the other some six feet above, supported on vertical posts. Fastened to the cylinders and stretched tightly between (each thread with a strain of about seven pounds), are the warp-threads, say 35 or 40 to the inch. The work is begun at the bottom and continued upwards; as finished, it is wound on the lower cylinder.

The warp is divided into two sheets (omitting certain less important details), thus: To each alternate thread a cord is loosely looped, the other end being fastened to a wooden bar above the workman's head; these cords are the "lisses." A little above the warp-ends of the lisses is a glass tube, one or two inches in diameter ("bâton de croisure"), which passes, horizontally, between the alternate threads of the warp and is held in position by these same threads. The effect of this tube is, that the outer sheet, to which the lisses are attached, and

which we may call *A*, for short, is kept a convenient distance away from the sheet nearer the workman, which we may call *B*. Now, if he grasps say, 40 of the lisses, and draws them downwards (towards himself), he will pull 40 of the warp-threads, forming the outer sheet, *A*, between and through the alternate threads of the inner sheet, *B*. When he releases the lisses, the threads of sheet *A* will spring back to their original position. This is the whole principle of the "haute-lisse" (high-warp) loom, though, of course, there are many details, not absolutely necessary in so short a paper, which have been omitted.

In the low-warp ("basse-lisse") loom, which is the usual form of the old-fashioned hand-loom, the warp is horizontal and the up-and-down movement of the two sheets of the warp is done by pedals, leaving both hands free to pass the bobbins or the shuttle to and fro. Some of the objections to this style of loom for tapestry are that the model to be copied, being placed *underneath* the warp, and seen *through* it, is neither clearly seen nor well lighted. The space being very limited, the model has to be cut in strips, and thus many valuable drawings by great artists have been destroyed. As the back of the finished product is towards the worker, it will readily be seen that he must reverse the design, like an etcher does. The greatest drawback of all is the difficulty of the worker to see the *front* of his tapestry. The advantages of the basse-lisse loom are the greatly increased speed and, consequently, decreased cost of the finished product. And when all is said, it is often difficult for even an expert to say with certainty whether a good piece of work was done on a high or low-warp loom. One curious proof occasionally presents itself. The bearded old weaver bent low over his loom, with head and beard close to it, and once in a while a hair of that old beard got woven in with the woof, and there we find it to-day.



HIGH-WARP LOOM

Front View. The Workman is seen through the Warp-Thread

And now, having finished our apprenticeship, but by no means thoroughly, let us to work. Of course, it is needless to say that we are at the Gobelins, and are artists of distinction. First, we make a tracing on transparent paper of our design, and then transfer it to the warp, drawing the outlines with great care around each thread; this is by no means an easy job, for remember, instead of firm canvas or paper, we have the long vibrating strings of the warp. The drawing completed we select our colors, each wound on its bobbin. The model we are to copy is hung on the wall behind us, so that, seated on our bench, back of what will be a glowing piece of tapestry, we can see the model only by looking over the shoulder or turning half round. In front of our to-be-tapestry we arrange one or even two mirrors, so that we can catch occasional glimpses of what we are doing without walking round to the front; a small hand-mirror is also convenient. Our tools are a heavy ivory comb for beating down the weft-threads, so that the

color may be solid and the warp unseen, an awl-like instrument for picking out threads, and a pair of scissors.

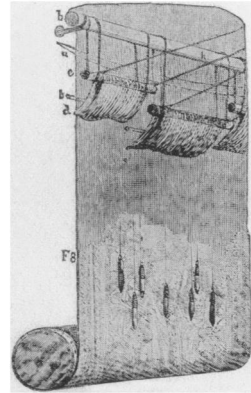
An apprentice has completed the blue border (about two inches wide) across the bottom; or, if the piece is long, this may be the side. On this border one looks for the mark of the factory, but unfortunately does not often find it. The modern mark of the Gobelins is a G, with a vertical bobbin across it. Brussels has a shield, with a B on either side. Often the weaver's *mark* is found, sometimes his *name*.

We now select from the basket beside us the color we require; this is knotted to the warp-thread at the left side of where that special color is to begin and close to the blue border. The left hand is thrust between the threads to further separate them (you remember how the glass tube holds them apart), the right hand follows from its side, seizes the bobbin and brings it as far to the right as it should go. The left hand now grasps the right number of lisses, by pulling them the same number of warp-threads of sheet A (the outer, or furthest from the worker), are thus drawn through sheet B. The right hand sends the bobbin back to where it started from; the lisses are let go, the warp returns to its previous position, and we have made two *shoots* or a *course* (in French "*une duite*"). The loose threads are tapped into place with the point of the bobbin, and we are ready for another course. This has taken a long time to describe, but when the same movements are made in actual practice, so rapid are they, that although we know exactly what the operator is doing, it is impossible to follow his motions. After a certain number of these courses have been made, they are beaten down hard with the ivory comb, then, possibly, this bobbin will be dropped and allowed to hang, to be taken up later, while another, an adjoining color, is started, and so on.

A day's work is about four square inches; that would make a square yard a year, in reality considerably more is accomplished; and as some of the looms are large, as many as eight workmen at a time are seen on the same tapestry. An expert "artist-tapisier" receives from \$650 to \$700 a year, so that, including the cost of maintenance, the value of the finished work is about \$600 to \$800 a square yard.

After the tapestry has left the loom it goes to the repair shop ("*atelier de rentraiture*"), where much work with the needle is required. If you examine a long piece of tapestry you will notice that the warp is horizontal; that means it was woven on end, as when on the loom the warp must be vertical. You will also notice that wherever the line dividing two colors is horizontal, there is a tendency for the material to pull apart. That is because the lower color ended at a certain warp-thread and the upper color began at the next; in consequence, when the tapestry left the loom there was a slit there. These slits occur all over the work, so that sewing them up sometimes occupies weeks.

Our work is now over, but a piece of tapestry does not reach its true per-



HIGH-WARP LOOM  
Back View. Showing the  
Lisses, Bobbins, etc.

fection till that greatest of colorists, Time, has toned down the often too brilliant

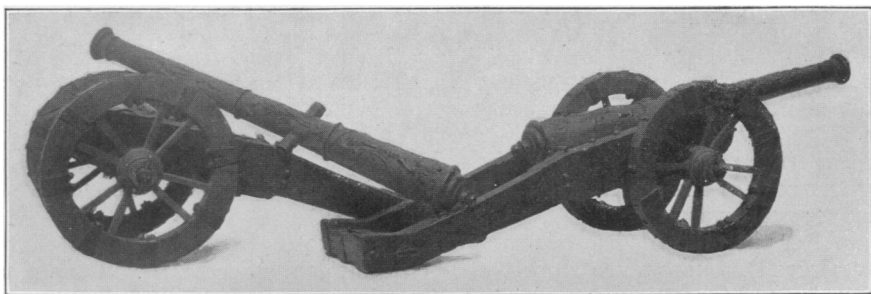


TAPESTRY  
In the Pennsylvania Museum

(To be concluded.)



## THE AUSTIN COLLECTION OF ARMS



Mounted Bronze Cannon of the Sixteenth Century

The valuable collection of arms and armor belonging to Mr. Samuel H. Austin, has been placed on exhibition in the Museum, filling two large cases. Many of the pieces are unique, while the majority reveal the most exquisite work of celebrated artists in damascening, inlaying, carving, enameling and lacquering.

hues, softening all with an exquisite shade of yellow gray, giving to good tapestry a "quality" no other form of decoration can attain to.

Some few, very few, pieces of Gobelins were sold. To-day one can, in theory, order a piece of Gobelins tapestry and pay for it in advance, but as all government work takes precedence, the chances of seeing the piece ordered in the usual space of a single life are so infinitesimal, that few there are who care to take the risk.

CHARLES E. DANA.